IN THE CLAIMS

Claims 1-3 have been canceled.

New claims 4-51 have been added as follows:

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4. (New) A process for the preparation of a silicon on insulator wafer, the process comprising implanting oxygen into a silicon single crystal wafer having a central axis, a circumferential edge, and a radius extending from the central axis to the circumferential edge, wherein the wafer is substantially free of agglomerated vacancy-type defects.

5. (New) The process of claim 4 wherein the silicon single crystal wafer has as oxygen content which is less than about 13 PPMA.

6. (New) The process of claim 4 wherein the silicon single crystal wafer has a concentration of carbon which is less than about $5x10^{16}$ atoms/cm^3.

7. (New) The process of claim 4 wherein the silicon single crystal wafer has a concentration of carbon which is less than about $5x10^{15}$ atoms/cm^3.

8. (New) The process of claim 4 further comprising subjecting the single crystal silicon wafer to an ideal precipitating wafer process.

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9.(New) The process of claim 8 wherein the single crystal silicon wafer is subjected to the ideal precipitating wafer process prior to implanting oxygen into the wafer.

10.(New) The process of claim 8 wherein the single crystal silicon wafer is subjected to the ideal precipitating wafer process after implanting oxygen into the wafer.

11.(New) A process for the preparation of a silicon on insulator wafer, the process comprising implanting oxygen into a silicon single crystal wafer having a central axis, a circumferential edge, a radius extending from the central axis to the circumferential edge, and a first axially symmetric region in which there is a predominant intrinsic point defect which is substantially free of agglomerated intrinsic point defects.

12.(New) The process of claim 11 wherein silicon self-interstitials are the predominant intrinsic point defect within the first axially symmetric region, the first axially symmetric region extending radially inward from the circumferential edge of the wafer and having a width, as measured from the circumferential edge radially toward the central axis, which is at least about 30% of the length of the radius of the wafer.

13.(New) The process of claim 12 wherein the first axially symmetric region is generally annular in shape and the wafer additionally comprises a second axially symmetric region, that is

generally cylindrical in shape, in which vacancies are the predominant intrinsic point defect, the second region located radially inward of the first region in the wafer.

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14. (New) The process of claim 11 wherein silicon self-interstitials are the predominant intrinsic point defect within the first axially symmetric region, the first axially symmetric region extending radially inward from the circumferential edge of the wafer and having a width, as measured from the circumferential edge radially toward the central axis, which is at least about 80% of the length of the radius of the wafer.

15. (New) The process of claim 14 wherein the first axially symmetric region is generally annular in shape and the wafer additionally comprises a second axially symmetric region, that is generally cylindrical in shape, in which vacancies are the predominant intrinsic point defect, the second region located radially inward of the first region in the wafer.

16. (New) The process of claim 11 wherein silicon self-interstitials are the predominant intrinsic point defect within the first axially symmetric region, the first axially symmetric region extending radially inward from the circumferential edge of the wafer and having a width, as measured from the circumferential edge radially toward the central axis, which is about equal to the length of the radius of the wafer.

17. (New) The process of claim 11 wherein the silicon single crystal wafer has as oxygen content which is less than about 13 PPMA.

18. (New) The process of claim 11 wherein the silicon single crystal wafer has a concentration of carbon which is less than about $5x10^{16}$ atoms/cm^3.

19. (New) The process of claim 11 wherein the silicon single crystal wafer has a concentration of carbon which is less than about $5x10^{15}$ atoms/cm^3.

20. (New) The process of claim 11 wherein vacancies are the predominant intrinsic point defect within the first axially symmetric region, the first axially symmetric region comprising the central axis of the wafer or having a width of at least about 15 mm, as measured along the radius of the wafer.

21. (New) The process of claim 20 further comprising a second axially symmetric region, that is generally annular in shape, in which silicon self-interstitials are the predominant intrinsic point defect, the second region being located radially outward of the first region.

22. (New) The process of claim 20 wherein the first axially symmetric region has a width which is at least about 25% of the length of the radius of the wafer.

23. (New) The process of claim 22 further comprising a second axially symmetric region, that is generally annular in shape, in which silicon self-interstitials are the predominant intrinsic point defect, the second region being located radially outward of the first region.

24. (New) The process of claim 11 wherein the first axially symmetric region has vacancies as the predominant intrinsic point defect and has a width with is about equal to the length of the radius of the wafer.

25. (New) The process of claim 11 further comprising subjecting the single crystal silicon wafer to an ideal precipitating wafer process.

26. (New) The process of claim 25 wherein the single crystal silicon wafer is subjected to an ideal precipitating wafer process prior to implanting oxygen into the wafer.

27. (New) The process of claim 25 wherein the single crystal silicon wafer is subjected to an ideal precipitating wafer process after implanting oxygen into the wafer.

28. (New) A process for the preparation of a silicon on insulator wafer, the process comprising implanting oxygen into a silicon single crystal wafer having two major, generally parallel surfaces, one of which is the front surface and the other of

which is the back surface of the silicon wafer, a central plane between the front and back surfaces, the circumferential edge joining the front and back surfaces, a surface layer which comprises a first region of the silicon wafer between the front surface and a distance, D_1, of at least about 10 micrometers, as measured from the front surface and toward the central plane, and a bulk layer which comprises a second region of the silicon wafer between the central plane and the first region, the silicon wafer having a non-uniform concentration of vacancies with the concentration of vacancies in the bulk layer being greater than the concentration of vacancies in the surface layer such that, upon subjecting the wafer to an oxygen precipitation heat treatment, a denuded zone is formed in the surface layer and oxygen clusters or precipitates are formed in the bulk layer with the concentration of the oxygen clusters or precipitates in the bulk layer being primarily dependant upon the concentration of vacancies.

29. (New) The process of claim 28 wherein D_1 is at least about 20 micrometers.

30. (New) The process of claim 28 wherein D_1 is at least about 50 micrometers.

31. (New) The process of claim 28 wherein D_1 is between about 30 and about 100 micrometers.

32. (New) The process of claim 28 wherein the wafer has a carbon concentration which is less than about 1×10^{16} atoms/cm^3.

33. (New) The process of claim 28 wherein the concentration of interstitial oxygen at distances greater than 3 microns from the wafer surface is at least about 50% of the concentration of interstitial oxygen in the bulk layer.

34. (New) The process of claim 28 wherein the concentration of interstitial oxygen at distances greater than 10 microns from the wafer surface is at least about 80% of the concentration of interstitial oxygen in the bulk layer.

35. (New) A process for the preparation of a silicon on insulator wafer, the process comprising implanting oxygen into a silicon single crystal wafer having two major, generally parallel surfaces, one of which is the front surface and the other of which is the back surface of the silicon wafer, a central plane between the front and back surfaces, the circumferential edge joining the front and back surfaces, a surface layer which comprises a first region of the silicon wafer between the front surface and a distance, D_1, of at least about 10 micrometers, as measured from the front surface and toward the central plane, and a bulk layer which comprises a second region of the silicon wafer between the central plane and the first region, the silicon wafer an asymmetrical vacancy concentration profile in which a maximum concentration is located between the central plane and the front

surface layer, the vacancy concentration generally increasing from the front surface to the region of maximum concentration and the difference in the concentration of vacancies in the front surface layer and the bulk layer being such that a thermal treatment at a temperature in excess of 750 °C, is capable of forming in the wafer a denuded zone in the front surface layer and oxygen clusters or precipitates in the bulk zone with the concentration of the oxygen clusters or precipitates in the bulk layer being primarily dependant upon the concentration of vacancies.

36. (New) The process of claim 35 wherein D_1 is at least about 20 micrometers.

37. (New) The process of claim 35 wherein D_1 is at least about 50 micrometers.

38. (New) The process of claim 35 wherein D_1 is between about 30 and about 100 micrometers.

39. (New) The process of claim 35 wherein the wafer has a carbon concentration which is less than about 1×10^{16} atoms/cm^3.

40. (New) The process of claim 35 wherein the concentration of interstitial oxygen at distances greater than 3 microns from the wafer surface is at least about 50% of the concentration of interstitial oxygen in the bulk layer.

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41. (New) The process of claim 35 wherein the concentration of interstitial oxygen at distances greater than 10 microns from the wafer surface is at least about 80% of the concentration of interstitial oxygen in the bulk layer.

42. (New) The process of claim 35 wherein the vacancy concentration generally increases from the front surface to the region of maximum concentration and generally decreases from the region of maximum concentration to the back surface and the difference in the concentration of vacancies in the front surface layer, the back surface layer and the bulk layer being such that a thermal treatment at a temperature in excess of 750 °C, is capable of forming in the wafer a denuded zone in the front surface layer and the back surface layer and oxygen clusters or precipitates in the bulk zone with the concentration of the oxygen clusters or precipitates in the bulk layer being primarily dependant upon the concentration of vacancies.

43. (New) The process of claim 35 wherein the vacancy concentration has a first maximum concentration located in a first region of maximum concentration between the front surface layer and the central plane and a second maximum concentration located in a second region of maximum concentration between the first region of maximum concentration and the back surface layer, with the vacancy concentration generally increasing from the front surface to the first region of maximum concentration, generally decreasing from the first region of maximum

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concentration to a region of minimum concentration located between the first and second maximum regions, generally increasing from the region of minimum concentration to the second region of maximum concentration and generally decreasing from the second region of maximum concentration to the back surface and the difference in the concentration of vacancies in the front surface layer, the back surface layer and the bulk layer being such that a thermal treatment at a temperature in excess of 750 °C, is capable of forming in the wafer a denuded zone in the front surface layer and in the back surface layer and oxygen clusters or precipitates in the bulk zone with the concentration of the oxygen clusters or precipitates in the bulk layer being primarily dependant upon the concentration of vacancies.

44. (New) The process of claim 43 wherein the region of minimum concentration is located between the first maximum concentration and the central plane.

45. (New) The process of claim 43 wherein the second region of maximum concentration is located at the central plane.

46. (New) The process of claim 43 wherein the vacancy concentration has a first maximum concentration located in a first region of maximum concentration between the front surface layer and the central plane and a second maximum concentration located in a second region of maximum concentration between the back surface layer and the central plane, with the vacancy

concentration generally increasing from the front surface to the first region of maximum concentration, generally decreasing from the first region of maximum concentration to the central plane, generally increasing from the central plane to the second region of maximum concentration and generally decreasing from the second region of maximum concentration to the back surface and the difference in the concentration of vacancies in the front surface layer, the back surface layer and the bulk layer being such that a thermal treatment at a temperature in excess of 750 °C, is capable of forming in the wafer a denuded zone in the front surface layer and in the back surface layer and oxygen clusters or precipitates in the bulk zone with the concentration of the oxygen clusters or precipitates in the bulk layer being primarily dependant upon the concentration of vacancies.

47. (New) A silicon on insulator structure, the structure comprising:

a single crystal silicon device layer in which there is a predominant intrinsic point defect which is substantially free of agglomerated vacancy-type defects;

a single crystal silicon handle wafer; and,

an insulating layer between the device layer and the handle wafer.

48. (New) The structure as set forth in claim 47 wherein the device layer has as oxygen content which is less than about 13 PPMA.

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49. (New) The structure of claim 47 wherein the handle wafer further comprises two major, generally parallel surfaces, one of which is the front surface and the other of which is the back surface of the silicon wafer, a central plane between the front and back surfaces, the circumferential edge joining the front and back surfaces, a surface layer which comprises a first region of the silicon wafer between the front surface and a distance, D_1, of at least about 10 micrometers, as measured from the front surface and toward the central plane, and a bulk layer which comprises a second region of the silicon wafer between the central plane and the first region, the silicon wafer having a non-uniform concentration of vacancies with the concentration of vacancies in the bulk layer being greater than the concentration of vacancies in the surface layer such that, upon subjecting the wafer to an oxygen precipitation heat treatment, a denuded zone is formed in the surface layer and oxygen clusters or precipitates are formed in the bulk layer with the concentration of the oxygen clusters or precipitates in the bulk layer being primarily dependant upon the concentration of vacancies.

50. (New) The structure of claim 47 wherein the handle wafer further comprises two major, generally parallel surfaces, one of which is the front surface and the other of which is the back surface of the silicon wafer, a central plane between the front and back surfaces, the circumferential edge joining the front and back surfaces, and a denuded zone which comprises the region of the silicon wafer from the front surface to a distance, D_1, of at

least about 10 micrometers, as measured in the direction of the central plane, and which contains interstitial oxygen, the silicon wafer having a concentration of interstitial oxygen in the denuded zone at a distance equal to about one-half of D_1 is at least about 75% of the maximum concentration of interstitial oxygen in the denuded zone.

51. (New) The structure of claim 47 wherein the handle wafer further comprises two major, generally parallel surfaces, one of which is the front surface and the other of which is the back surface of the silicon wafer, a central plane between the front and back surfaces, the circumferential edge joining the front and back surfaces, a front surface layer consisting of a first region of the silicon wafer within a distance, D_2, of no more than about 15 micrometers from the front surface and a bulk layer comprising a second region of the silicon wafer between the central plane and the front surface layer, the bulk layer having a substantially uniform oxygen concentration and a concentration of crystal lattice vacancies such that upon subjecting the silicon wafer to an oxygen precipitation heat treatment consisting essentially of annealing the silicon wafer at 800°C for four hours and then at 1000°C for sixteen hours, the silicon wafer will contain oxygen precipitates having a concentration profile in which the peak density of the precipitates in the bulk layer is at or near the central plane with the concentration of the precipitates in the bulk layer generally decreasing in the direction of the front surface layer.